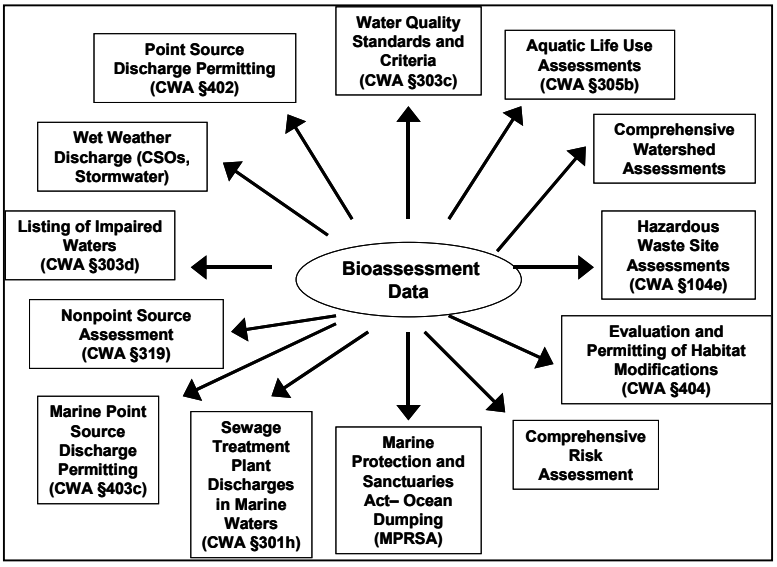
Executive Summary

Biological communities integrate the effects of different pollutant stressors such as excess nutrients, toxic chemicals, increased temperature, and excessive sediment loading and thus provide an overall measure of the aggregate impact of the stressors. Biological communities respond to stresses of all degrees over time and, therefore, offer information on perturbations not always obtained with episodic water chemical measurements or discrete toxicity tests. The central purpose of assessing the biological condition of aquatic communities is to determine how well a water body supports aquatic life.

The diversity and condition of biological communities reflect overall ecological integrity (i.e., chemical, physical, and biological integrity). Therefore, bioassessment results directly assess the status of a waterbody relative to the primary goal of the Clean Water Act (CWA). Biological assessments are crucial to evaluating ecosystem health and provide crucial water quality planning information for managing more complex water quality problems (see graphic listing uses in water quality programs).



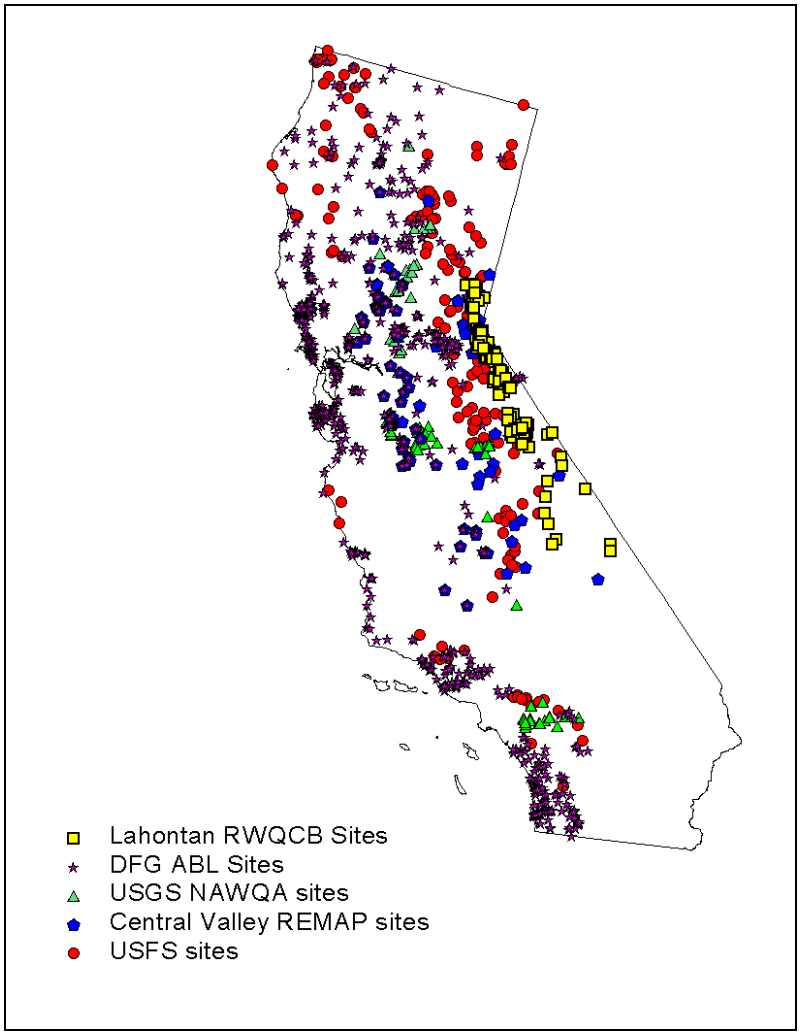
Use of Bioassessment in State Water Quality Programs

The purpose of this report is to document the salient information on the variety of bioassessment programs in California for streams, and to provide recommendations for a universal movement toward a standardized bioassessment program that will serve several entities, especially the SWRCB and RWQCBs. Key findings of this study and report are:

- California has over 200,000 miles of streams and rivers throughout its vast network of mountains and valleys.
- Ranked as the second state in number of stream/river miles (Alaska having the highest number), California is in its infancy in terms of viable biological assessment and monitoring to assess ecological condition.
- The State Water Resource Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB), who are responsible for implementing water quality standards for California=s surface waters, have only recently begun to apply biological assessment principles to their monitoring programs.
- To date, only a few selected instances in regulatory actions have occurred where biological information was used to support management decisions.
- The broader regulatory initiatives, such as measuring the attainment of Aquatic Life Use

designations as mandated by Section 305(b) of the CWA, has not relied on biological assessments in California.

- The last decade has been an important period of advancement and refinement of stream biological assessment for California.
- As a general data-gathering tool used for problem identification (i.e., not used for regulatory purposes), bioassessments have been conducted at over 3000 sites by a multitude of agencies, universities, and other entities.
- Dissimilarities in techniques and purposes for the bioassessments have precluded a universal comparability and data integration effort.
- Five candidate programs exist in California that have scientifically valid and robust methods, and have similar purposes and scope, which could provide the framework for the implementation of a statewide bioassessment approach.
- This reports documents 36 bioassessment programs, representing 22 government agencies (including tribes), 4 universities, 2 municipalities, and 8 environmental interest groups.
- The method developed by the California Department of Fish and Game (CDFG), known as the California Stream Bioassessment Procedure (CSBP) is the most widely used throughout the state, with more than 2500 sites sampled.



Stream Bioassessment Sites Sampled by Candidate Programs

Recommendations include:

- consideration of multihabitat methods to improve detection of non-chemical perturbations
- continuing to collect replicate bioassessment samples for the purpose of precision estimates, and possibly reducing the number of replicates to two or three as a compromise between statistical power and cost.
- closer interaction between the SWRCB and DFG-ABL and SNARL to consider evaluating its extensive ecological database for proceeding with characterizing reference conditions.
- creating a statewide database of bioassessment data that can accommodate the large quantity of data that will be produced in California.
- combining the resources of a statewide database and CAMLnet in order to provide California with a consistent and standard framework for calibrating biological indicators for use on a statewide basis.
- appointing a full-time SWRCB employee to manage the statewide database and provide technical support to database users throughout California.
- developing viable biological indicators and endpoints for assessing biological condition
- incorporating bioassessment into California's water quality regulatory programs
- making funding available for a concerted, statewide bioassessment program.